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US 4917431 A      US 4333678 A

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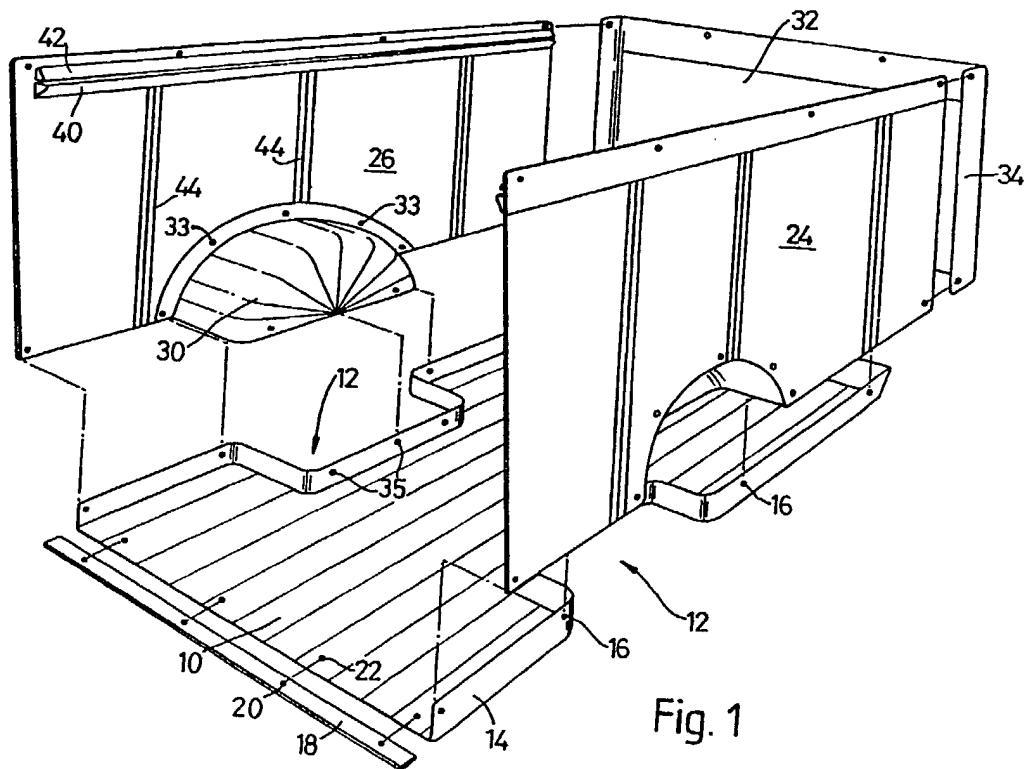
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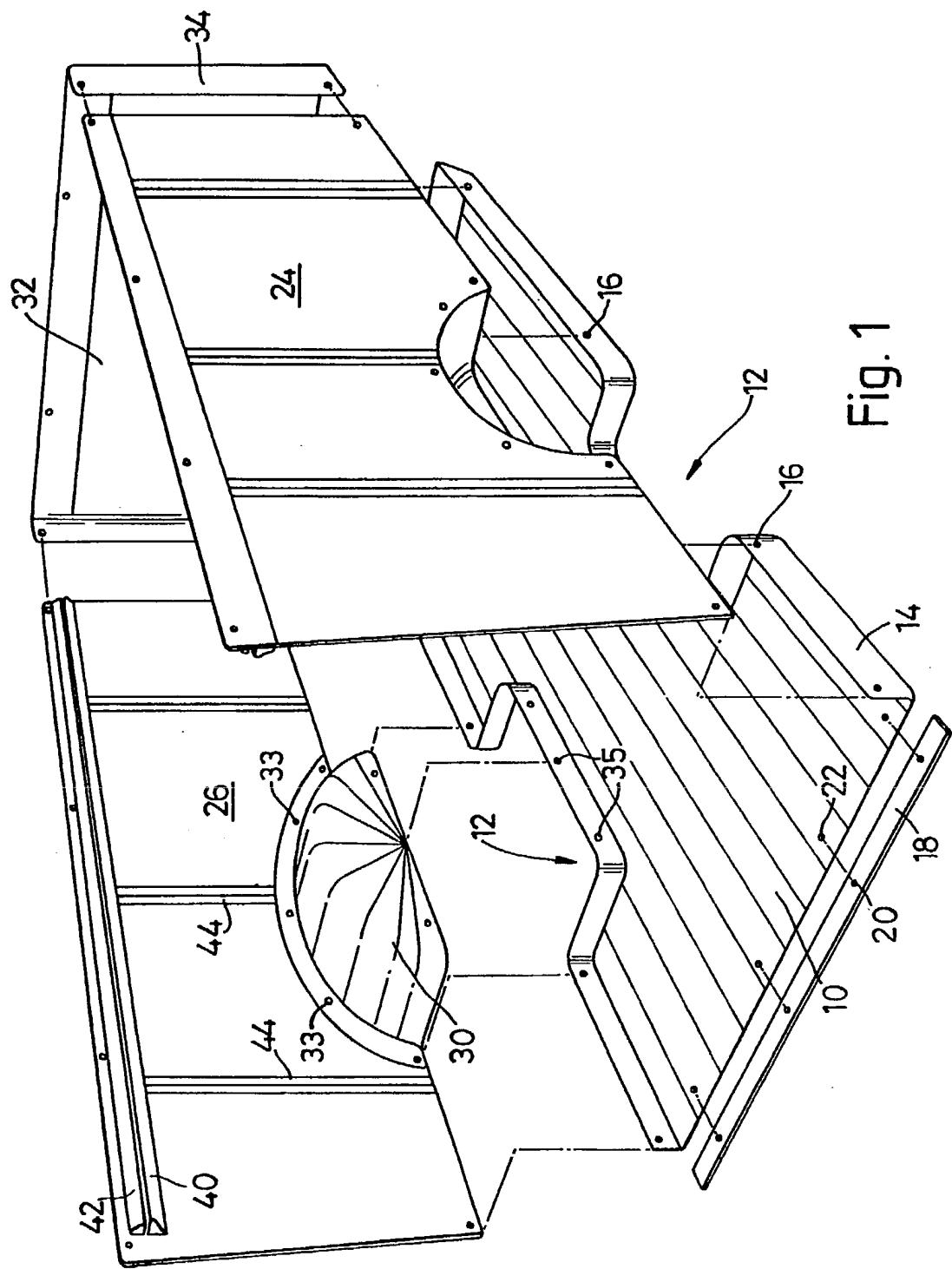
**(54) Vehicle load compartment liner**

(57) The liner comprises several moulded plastics panels forming the floor (10), side walls (24, 26), front wall (32) and wheel arches (30). The panels are provided with reinforcing ribs which also have an insulating effect. Some ribs, such as the horizontal ribs (40, 42) cooperate to define a slot into which a shelf panel may be inserted; vertical ribs (44) may be used to support vertical partitions. Acoustic insulating material may be provided on the back of the liner panels and fill the hollows provided by the ribs.



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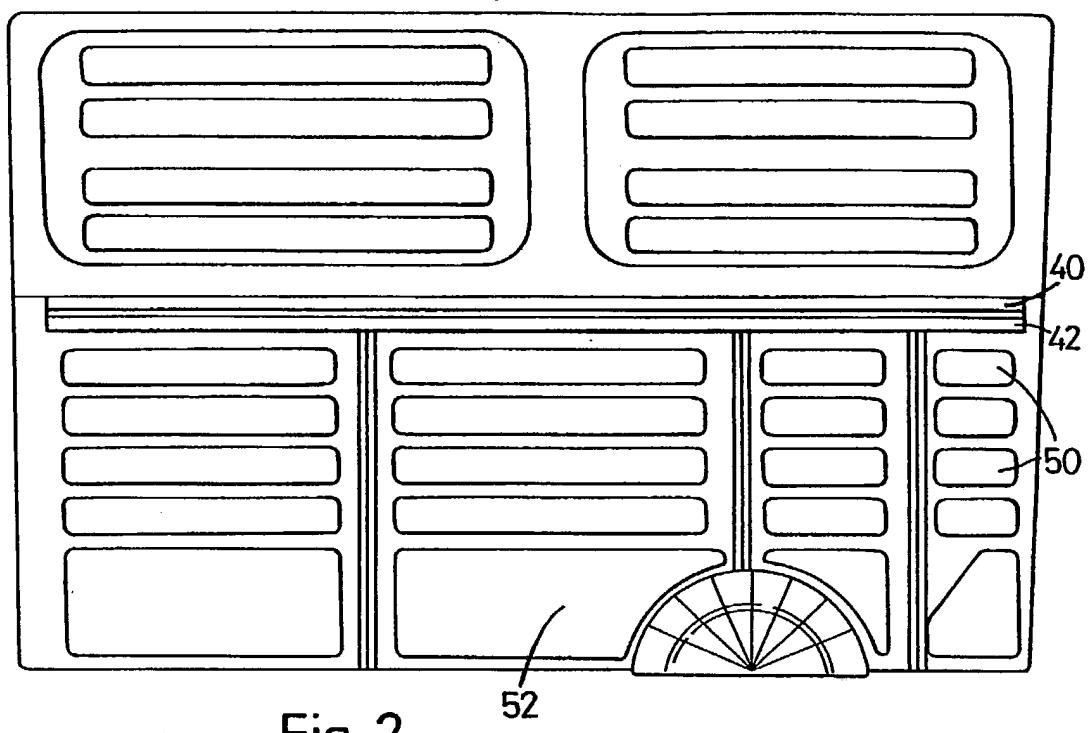


Fig. 3

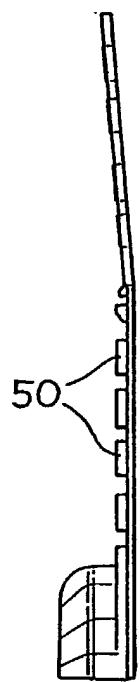
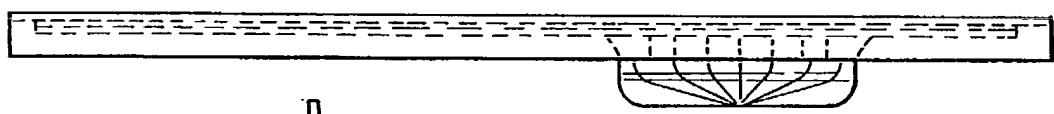


Fig. 4

LINER SYSTEM

This invention relates to commercial road vehicles for example vans and trucks.

It is known from EPA 264186 to provide a cargo bed liner system for vehicles using a rigidified carpeting material made of needle-loomed staple fibers, which is creased so that it can fold to provide integral side walls, end walls, tail gate and floor portions, held in place in the vehicle by Velcro-type fasteners. Such a liner occupies a substantial volume, has a substantial weight making it difficult to move, transport and install, and because the respective panel-like areas are primarily planar, is not suitable for many modern motor vehicles which tend to have complex internal shapes. The fibers are unsatisfactory for many purposes because they would become contaminated by spillages and be difficult to clean.

U.K. Patent GB 2115754A and 2118109A also disclose pre-creased or hinged panels of sheet plastics or plywood which are also awkward to store, handle and fit and unsuitable for the complex shapes involved.

Another prior art document is GB 1197956 which makes a lining for mine trucks which are to carry for example five ton boulders by providing wear resistant elastic material suspended above the floor of the truck so as to be capable of absorbing impact by movement. Such an arrangement is unsuitable for the ordinary commercial loads in smaller road transport vehicles.

The object of the present invention is to provide an improved load liner which is simpler and more convenient to store, handle and fit, and which is suitable for food vehicles in its ability to be cleaned and/or sterilised.

According to the invention a load liner for a commercial road vehicle comprises a plurality of separate panels each to form part or whole of the floor, or other

wall of the vehicle liner, each made as a moulding of plastics material shaped to conform generally to the contours of the required surface of the vehicle to which it is to be fitted and provided with portions protruding into the load space of the vehicle to be spaced from the said wall thereof.

Preferably the parts are cut away over the areas to be aligned with wheel arches, and separate detachable parts are used to cover the wheel arches. This facilitates repair of the most vulnerable areas of the liner.

The individual panels and parts are to be connected to one another by mechanical fasteners for example screws and nuts, and ones of them may be connected to the vehicle body by further mechanical fasteners which are to be engaged with available features in the body. In this connection it is to be noted that an ordinary commercial motor vehicle for example a Ford Transit (RTM) van has a number of holes provided in struts and other components exposed to the load area which are available and can be used for anchorage. An important feature of the invention is that those holes are both used for anchorage, and hidden by the liner, thus simplifying cleaning and/or sterilisation of the van interior.

It will be appreciated that the dimensions and shapes of one specific vehicle for example the Transit van are invariably substantially the same, but differ from those of another van for example a Sherpa RTM van, and hence the liner of the present invention is to be tailor-made for a specific van. In order to suit several different vans there will be variations in dimensions and shape and in location and possibly type of fasteners which are suitable to hold the panels against the walls and floor of the van, and possibly also against doors of the van.

The preferred material for the liner system of the present invention is a polyethylene or an ABS or possibly any other vacuum formable or pressable plastics material,

and possibly one of food quality. Alternatively glass reinforced plastics may be used, with a cloth or felt reinforcement laid into a mould with the usual gel and other coats, and cured in the mould. The material preferably is arranged to have relatively smooth surfaces, apart from the protrusions as hereinafter described, and with an absence of dirt traps, enabling easy cleaning and e.g. chemical sterilisation or use of disinfectants between successive loads especially when food is carried.

According to an important feature of the invention the liner material per se is backed by complementary shaped panels of acoustic insulating material such as a foam material e.g. a thermoplastic such as a cross-linked high density polypropylene foam. This material maybe conformed to shape by placing a cold sheet of the foam in the forming dies (or on a die), super-imposing a hot sheet of liner material and pressing the hot sheet to the lower die configuration with the foam sandwiched therebetween, using either a top die or by vacuum forming as appropriate. Alternatively, glass-fibre and /or fixing resin may be laid-up or e.g. sprayed on to the back of the formed and shaped panels for the same sound-deadening purposes.

Typical applications of the invention are illustrated in the accompanying drawing in which:-

Figure 1 is a part-exploded view of one embodiment, and

Figures 2-4 are elevation, plan and end elevation of a panel for a second embodiment.

In the drawing Figure 1 shows the panels alone (without showing the sound-deadening backing), a first pressing or moulding 10 forms the floor liner and has recesses 12 to extend around the wheel arches. This panel has an integral upstanding skirt 14 around three of its sides and this is apertured e.g. at 16 for screws or similar fasteners to be secured to the side panels. Additionally, the tailgate or loading door end is provided with an extra reinforcement strip 18 secured by

screws or the like passed through holes 20 in the strip and holes 22 in the floor. This is protection against wear at the most exposed area, particularly against loads slid along the floor from the door end.

It will be noted that the two side wall panels 24 26 are handed and are not identical and each of these has a separate panel 30 to enclose the wheel arch. This panel 30 (shown fixed in position in Figure 1) may have a flange 31 to take fasteners 33 at the points shown, for this fixing. The part is additionally secured by fasteners 35 engaging the flange on the floor liner. The front panel 32 has inturned end edges 34 to cooperate with the side panels in a similar way to the flange 14 cooperating with the side panels.

As shown in the version illustrated in Figures 2-4 the panels may be generally planar but reinforced by ribs of one kind or another which may be simple reinforcing channels or protrusions, i.e. each panel is made from a sheet of material so that it is of substantially constant thickness and each of the ribs is hollow. The ribs or channels formed on the floor panels preferably extend longitudinally for ease of sliding loads along the floor and for ease of cleaning enabling the floor to be swept out or mopped out with drainage over the tailgate.

The side panels 24 26 in the first embodiment (Fig.1) are provided with a pair of closely adjacent ribs 40 42 which provide a narrow slot therebetween enabling a generally shelf-like panel to be inserted parallel to the floor panels and spanning between the side panels either to enclose the lower portion or to provide the base for a second storage area superimposed above the floor. It will be appreciated that further wall panels may also be provided extending above that shelf and possibly a roof liner so as to complete a liner within the whole of the interior of the vehicle. In Figures 2-4, the upper wall panels are unitary with the lower ones.

The side panels in Figure 1 are provided with vertically extending rib formations 44 which may be used

in a similar way to the ribs 40 and 42 to enable transverse partitions to be used, or these ribs 44 may be simply reinforcements which rigidify the panels. They also have an insulating effect. If desired additional runners for shelves or the like may be provided similar to those 40 42 at spaced positions on each side wall.

The panels shown in Figures 2-4 are similar to the panel 24 except as mentioned to extend over a greater height of the side wall of the vehicle and are provided with hollow box-like projections for example 50 and 52 which extend a short distance into the interior of the vehicle and which are for the purposes of increasing the rigidity of the panel, providing an insulating effect to the panel interior by virtue of the air trapped between those recesses and the vehicle wall, and providing additional protection against impact damage. Alternatively instead of using empty cavities for air insulation, all of the panels, or ones of them, may be backed by acoustic insulation as described earlier in the specification. When using a sheet of foam or like, conformed to the shape such as in Figures 2-4, the two (liner plus backing) effectively form a laminate. Alternatively and especially if flock or like is sprayed on for insulation, it may be the mentioned hollow box-like projections which contain the insulant.

CLAIMS

1. A load liner for a commercial road vehicle comprising a plurality of separate panels each to form part or whole of the floor, or other wall of the vehicle liner, each made as a moulding of plastics material shaped to conform generally to the contours of the required surface of the vehicle to which it is to be fitted and provided with portions protruding into the load space of the vehicle to be spaced from the said wall thereof.
2. A load liner as claimed in Claim 1 comprising a first panel to line the floor of the vehicle and having lateral portions cut away about the wheel arches of the vehicle, a pair of side panels to line the side walls of the vehicle and further panels each to enclose a wheel arch.
3. A liner as claimed in Claim 1 or Claim 2 wherein the individual panels are connected together and to the vehicle body by mechanical fasteners.
4. A liner as claimed in any preceding claim made as vacuum forming from a plastics material.
5. A liner as claimed in any of Claims 1-4 made as a pressing from plastics material.
6. A liner as claimed in any of Claims 1-4 made of a fibre reinforced plastic laid in a mould with gel and other coats and cured in the mould.
7. A liner as claimed in any preceding claim wherein the liner material per se is backed by complimentary shaped panels of acoustic insulating material conformed to the shape of the panels.
8. A liner as claimed in any of Claims 1-7 wherein each of the panels is backed by a flock lining.

9. A liner as claimed in any preceding claim wherein ones of the panels are provided with hollow ribs extending lengthwise of the panels.

10. A liner for a road vehicle substantially as described with reference to the accompanying drawings.

## Patents Act 1977

Examiner's report to the Comptroller under  
Secti 17 (The Search Report)

Application number

9211627.6

## Relevant Technical fields

(i) UK CI (Edition K ) B7B (BPA, BPC, BPX)

Search Examiner

(ii) Int CL (Edition 5 ) B60R

PAT EVERETT

## Databases (see over)

(i) UK Patent Office

Date of Search

(ii)

13 JULY 1992

## Documents considered relevant following a search in respect of claims

ALL

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	US 4917431 A (MCDONALD) See figure 2, note ribs 88	1 3 9
X	US 4333678 A (MUNOZ) Figure 2, note ribs 12e	1 3 4

Category	Identity of document and relevant passages	Relevance to claim(s)

#### Categories of documents

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P: Document published on or after the declared priority date but before the filing date of the present application.

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